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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/820,140	03/28/2001	Yoshihiro Morimoto	YKI-0066	2123

23413 7590 01/26/2004

CANTOR COLBURN, LLP  
55 GRIFFIN ROAD SOUTH  
BLOOMFIELD, CT 06002

EXAMINER
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LEE, GRANVILL D

ART UNIT	PAPER NUMBER
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2825

DATE MAILED: 01/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/820,140

Applicant(s)

MORIMOTO ET AL.

Examiner

Granvill D Lee, Jr

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AW

-- The MAILING DATE of this communication appears in the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

The amendment filed on 7/16/03 has been received and acknowledged to be found unpersuasive in view of the prior art of record, however the new rejection can not be considered final.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohtani et al. (US Pat. 5,605,846) in view of Williams et al. (US Pat. 6,238,582).

In view of these claims, Ohtani et al. uses a method of producing a semiconductor device comprising the steps of forming a non-crystal or amorphous semiconductor film on a substrate; heating the non-crystal or amorphous semiconductor film to a recrystallized state; however Ohtani et al. does not show eliminating projections generated by said heating on said non-crystal semiconductor film using a physical elimination method, like particle beam. Further, Ohtani et al. fails to explicitly state that an ion milling method

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is used at various angles to smooth the amorphous layer. Additionally, such projections are inherently formed. Williams et al. uses an ion milling process to effect uniformity (Col. 1 lines 25-30) of various layers, by using the process at various angles (Col. 8 lines 27-50).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the works of Ohtani et al. with those of Williams et al. in order to achieve a better uniform etching result, since the advantage of using ion milling is excellent uniformity and control (Col. 1 lines 25-30).

In view of claims 2 and 5, Williams et al. uses an ion beam technique to smooth out amorphous layers (Clm. 53 and 61).

In view of claims 3 and 6, Williams et al. uses an ion beam at low or high incident angles (Col. 8 lines 30-50).

### ***Response to Applicant***

The applicant ignores the fact that forming a non-crystal layer and subject the layer to heating, can inherently form non-uniform regions or non-uniform layers on the substrate, which are simply projections or surface defects. The normal distribution of these projections are often eliminated by heating, laser or etching methods. Clearly Ohtani et al. crystallizes along a plane other than the (111) plane (Col. 1 line 45-Col. 2 line 5) this is strongly uniform, and further suggests that any other orientation is not favorable to the

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device. A favorable outcome would result if the focus shifted to exact nature of the grain boundary projections, the optimized angle of the beam (see Williams) or how the electric field serves to eliminate these projections.

***Contact Information***

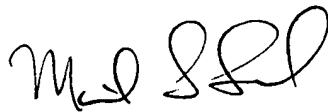
Any inquiry concerning this communication or earlier communications for the examiner should be directed to Granvill Lee whose telephone number is (571) 272-1897. The examiner can be normally reached on Monday, Tuesday, Thursday and Friday from 7:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are not successful, the examiner's supervisor, Matthew Smith can be reached on (571) 272-1907. The fax phone number for this group is (703) 872-9306.

Any inquiry of a general nature relating to status or otherwise should be directed to the receptionist whose telephone number is 703-308-1782.

Examiner  
Granvill Lee  
Art Unit 2825

Gl  
1/4/04

  
MATTHEW SMITH  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800